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**Yang et al.**

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(54) **METHOD FOR ISOLATING  
CROSS-REACTIVE APTAMER AND USE  
THEREOF**

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(58) **Field of Classification Search**  
None  
See application file for complete search history.

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(57) **ABSTRACT**

The subject invention provides a novel SELEX strategy for isolating cross-reactive aptamers that recognize a core structure of a small-molecule family and bind to each structurally-similar molecule in said family. The subject invention also provides methods, assays, and products for detecting small-molecule targets of the family in a sample in both clinical and field settings. Such method is based on an aptamer sensor that reports the presence of small-molecule targets via a sensitive colorimetric signal for naked-eye detection. The subject invention further provides exonuclease-based methods for generating structure-switching aptamers from fully folded aptamers and developing electrochemical aptamer-based (E-AB) sensors for rapid and sensitive detection of synthetic cathinones.

**17 Claims, 16 Drawing Sheets**  
**(14 of 16 Drawing Sheet(s) Filed in Color)**  
**Specification includes a Sequence Listing.**